

GUITERAS (J) & WHITE (J. W.)

A CONTRIBUTION <sup>DUP.</sup>

TO THE

# HISTORY OF INFLUENZA:

A STUDY OF A SERIES OF CASES.

BY

JOHN GUITÉRAS, M.D.,

AND

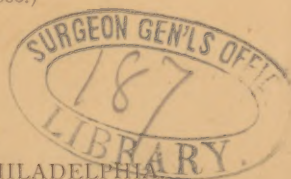
J. WILLIAM WHITE, M.D.

(REPRINTED FROM THE PHILADELPHIA MEDICAL  
TIMES, APRIL 10, 1880.)

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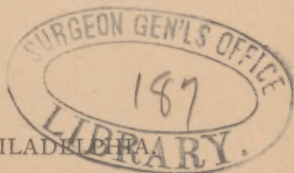
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MR. JOHN HUXHAM, of Plymouth, England, in his "Observations on the Air and Epidemical Diseases,"\* writing of the month of February, 1733, gives the following succinct and interesting description of a "distemper" which at that time affected multitudes of people in his neighborhood: "The disorder began at first with a slight shivering; this was presently followed by a transient erratic heat and headache, and a violent and troublesome sneezing; then the back and lungs were seized with flying pains, which sometimes attacked the heart likewise, and though they did not long remain there yet were very troublesome, being greatly irritated by the violent cough which accompanied the disorder, in the fits of which a great quantity of a thin, sharp mucus was thrown out from the nose and mouth. These complaints were like those arising from what is called *catching* cold, but

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\* Translated from the Latin, vol. i., London, 1758.

presently a slight fever came on, which afterwards grew more violent ; the pulse was now very quick, but not in the least hard and tense like that in a pleurisy ; nor was the urine remarkably red, but very thick, and inclining to a whitish color ; the tongue instead of being dry was thickly covered with a whitish mucus or slime ; there was an universal complaint of want of rest and a great giddiness. Several likewise were seized with a most racking pain in the head, often accompanied by a slight delirium. Many were troubled with a *tinnitus aurium*, or singing in the ears ; and numbers suffered from violent ear-aches. The sick were in general very much given to sweat, which, when it broke out of its own accord, was very plentiful, and continued without striking in again, and did often in the space of two or three days wholly carry off the fever. You have here a description of this epidemic disease such as it prevailed hereabouts, attacking every one more or less ; but still, considering the great multitude that were seized by it, it was fatal to but few, and that chiefly infants and consumptive old people. It generally went off about the fourth day, leaving behind a troublesome cough, which was very often of long duration, and such a dejection of strength as one would hardly have suspected from the shortness of the time."

The series of cases to which we wish to call attention, and the peculiarities of which we will presently detail, must be



considered as typical of this same epidemic disease now called influenza, not one known symptom of that affection being wanting. They have occurred originally in a family returning from Europe to Philadelphia early in January, and have apparently been handed from them to others. For full and accurate accounts of the characteristics of influenza during several epidemics, and as described by many eminent physicians, ancient and modern, we must refer the reader to the various publications on the subject.\* These descriptions will be found to separate the disease in question from those affections to which it most closely approximates, viz., the winter colds and catarrhs so prevalent at this time of year.

If, however, the symptomatology is alone sufficient to establish this distinction, we find in the etiology a wider gap between the two diseases, and in this connection there are still several problems to be solved. Upon some of these we may aid in throwing light. The series will be found to consist of a number of cases more or less brought in contact, on the one hand, with the remains of an individual who very probably died while convalescing from the disease, and, on the other hand, with several living subjects who came from a point of infection.

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\* "Annals of Influenza in Great Britain" (Sydenham Society's Publication, 1852); Bierner, in Virchow's Handbuch der Speciellen Path. und Ther. (fünf. Band); several contributions by Nonat, Vigla, etc., to Arch. Gén. de Méd. for 1837; article by Gintrac in Nouv. Dict. de Méd. et de Chir.

Influenza is now prevailing in Europe. We know of its presence in Cadiz, Spain, during the months of January and February, and letters from Paris, written soon after the departure of the persons who seem to have brought the disease here, inform us that there was at that time an epidemic of "la grippe" in that city. A letter from Dr. Fothergill to the *Philadelphia Medical Times* of March 27 is devoted to the description of an epidemic and very fatal bronchitis existing in London at the time of writing. Though we cannot find that he gives to the disease any other name than "*the fogs*," we believe that he describes an epidemic of influenza.

Did the patients affected in our city contract the disease from the first case, one of the travellers, or did they get it from the remains which were embalmed, brought here, and, after exposure, interred? Further it may be asked, if from the cadaver, was it the source of infection merely as a poison-carrier, a neutral surface upon which the poison rested, or was it as an active agent, a poison-producing surface? In other words, does our local epidemic show the disease to be miasmatic or contagious? If a miasm which loaded the atmosphere of Paris was brought in the coffin and in the clothing of the deceased, the family of the undertaker at whose house the body was changed from one coffin to another, and where it remained more than one day, should have been affected; but we find that they were not. Indeed, from



this point of view we cannot understand how the disease has not already taken a foothold upon our shores, when so many things that might be carriers of the miasm are constantly being brought from Europe. It is true that most of the individuals (with three exceptions—see Cases XVI., XVII., and XVIII.) who contracted the disease either lived in or visited the house to which the cadaver was transferred, and it is also true that not one of them became the starting-point of local epidemics.

To our minds this only proves that the disease is not very contagious,—a conclusion that we had already arrived at after reading the literature of the subject; and it brings up the question of *degree* of contagiousness, which we think is too much overlooked.

Cases XVI. and XVIII. certainly received the disease by contagion. The latter was housekeeper to Case VI., and never visited the infected house. She probably contracted the disease from Case VI. However, it may be said that she unpacked the luggage brought from Europe by the latter. But in regard to Case XVI., who lived in a distant quarter of the city, we must say that he could have contracted the malady in no other way than by his intercourse with Case VI., his physician, who, whilst suffering with the disease, was attending him for some other trouble. As we are going to press we find that the wife of Case XVI. has contracted the disease, and now has a well-marked case.

As far as can be concluded without the aid of experimental pathology, we must admit from the study of these cases that contagion is one of the channels through which this disease tends to spread.

At the house of the family of Case I. was a concurrence of circumstances favoring both contagion and miasmatic development. The exposure of the cadaver, one patient already affected with the disease, the anxiety and depression of the family,—a powerful predisposing cause,—the baggage just arrived and unpacked, all seem reasons why we may say, though maintaining a theory of contagion, that the house and people in it became both infective and infected. The poison accumulated there and multiplied to such an extent that the agents which are constantly in operation bringing about the destruction of the infecting causes were not sufficient, even in a city where the epidemic is not general, to prevent the spread of the disease.

But what was the starting-point in our cases? Was it a miasm pervading Paris, or was it an organism arising from the sick in Paris? We suppose both: in other words, we believe that influenza belongs in some respects to the class of miasmatic-contagious diseases. The whole subject, however, of the genesis of acute infective diseases is still surrounded with obscurity, malaria indeed being the only one about whose place in the classification there can be no doubt. Leaving this matter for future discussion, we will proceed to a brief general

description of the symptoms of influenza, as observed by us in these cases.

*Symptoms.*—The disease may be ushered in with a chill, but more frequently with *ereps*. Coincidentally or closely following there is sore throat, with redness of the mucous membrane, but scarcely any swelling, or, in other cases, uncontrollable sneezing or intense headache. The prostration, which is a marked feature of the disease, may be already apparent, or may develop on the second or third day with the fever. The latter is not high, may be intermittent, and is generally remittent, with evening exacerbations. In some of the stages, but frequently throughout the attack, we have profuse sweating, especially at night. Only in cases which may be called abortive did the sweating assume the character of a critical discharge. At first the pulse is frequent, but always soft and rather small. With the febrile manifestations, two symptoms, which sometimes are present even in the prodromal stage, either make their appearance or become decidedly prominent, viz., prostration and cough. When the first is very marked, the headache intense, and the fever higher than usual, the nervous symptoms concomitant with such a combination of circumstances may give to the case the appearances of serious cerebral disorder, so that Case IV. was for a moment suspected to be one of acute miliary tuberculosis, the sweating and the pulmonary symptoms contributing much to give this impression.

The cough is very peculiar. It is accompanied with well-marked hoarseness. It is paroxysmal, spasmodic, dry, and followed by the expectoration of small quantities of tenacious mucus, seldom tinged with blood. It reminds the observer of the paroxysms of whooping-cough, such as are seen in the adult, where the kinks of coughing are not so apt to be followed by the inspiratory whoop, probably because the respiratory muscles are more under the control of the will than in children. Further, it is the same cough met with in croupous bronchitis and in cases where there is pressure upon the root of the lung. The voice is like that of cases of intrathoracic tumor, hoarse, and becoming exhausted towards the end of the phrase, apparently for want of wind,—an evidence either of pressure on the trachea or of disturbed innervation of the vocal apparatus.

Most of the patients have complained of a sense of suffocation; but it may be said that the dyspnœa and cyanosis, though present, have not been as marked as in other epidemics. Difficulty of deglutition has been present in three cases; vomiting in the majority of them. All have had thoracic pains. These appear early with the cough, and last, with diminishing violence, throughout the attack. They consist of a sense of soreness behind the sternum, and sharp pains darting along the sides of the chest, by no means exclusively upon the side affected with the so-called pneu-

monia of previous writers. We leave to our cases a further description of the course of the disease.

*Case I.*—The first of these cases occurred in London on December 12, 1879. Mr. W., who was travelling on account of an old cerebral trouble, complained of vague, shooting pains in his chest. There were no physical signs of disease discoverable. The pains seemed to yield to the external application of mustard. Three days later, in the absence of further symptoms, he went to Paris, apparently well bodily, but in a state of profound mental depression. Thirty-six hours after his arrival in Paris an extensive pleural effusion of the right side was discovered, extending from the base of the lung to the spine of the scapula. This came on suddenly, a careful examination about ten hours previously having failed to demonstrate any alteration of normal conditions. It was attended with almost no fever, the pulse ranging from 85 to 90, and being soft and compressible, occasionally intermittent; the temperature  $98.5^{\circ}$  to  $99^{\circ}$ ; respirations, 28 to 32.

A blister was applied, and a decoction of *triticum densleoni* and bicarbonate of sodium were administered, and in a few days nearly all physical signs had disappeared, and the patient was up and seemingly convalescent. A day or two later, however, the mental depression recurring, he returned to bed, and gradually developed febrile symptoms, which ultimately proved to be due to a progressive encephalo-meningitis, that resulted fatally on December 30. At the time of relapse, however, the condition of the right side of his chest was as follows, Dr. Pidoux and Dr. Guéneau de Mussy being in consultation. There was dulness over the inferior portion of the

right lung, not arising above two inches from the edge of the chest. In this region the respiratory murmur was weak, remote, and softly blowing,—symptoms which were attributed to the remains of a pleural effusion at this point. Above, subcrepitant rhonchus was heard over the lower half of the lung, but moist, rather large, and conveying the idea of a simple congestion. Some rough coarse sounds, rather superficial, seemed referable to the presence of exudative membrane in the pleura.

These signs gradually decreased as the central trouble progressed, yet subjective symptoms became prominent, and troublesome, severe pain in the *left* side of the breast was complained of for hours, although nothing to indicate its cause could be found. Until the fever due to the encephalitis came on, the pulse was soft, intermittent, and variable in frequency, often running down to 65 or 60 a minute. There was almost no cough, and no expectoration, during the entire case. Sweating was so profuse as to be one of the chief sources of annoyance to the patient, a few moments' sleep being followed by saturation of the underclothing and even of the bedding.

The daughter, son, and nephew of Mr. W., who had been travelling with him, returned to their homes in this city immediately after his death, leaving Liverpool on January 3. During the voyage the former suffered almost continuously with headache, and had occasional cough. The others seemed to be well.

*Case II.*—On January 19 the son developed a pharyngitis which at first seemed to be of a rheumatic character, the pain in swallowing being out of all proportion to the inflammatory appearances, which were very slight. Within a day or two, violent headache, intense earache, and an annoying cough made



their appearance, apparently by extension of the irritation along the Eustachian tubes and into the frontal and mastoid sinuses and the larynx. These symptoms persisted for a week or more, pain in the chest and excessive sweating being superadded. The physical signs in this case from first to last consisted in a feebleness or almost absence of respiratory murmur at the base of the right lung and increased vocal fremitus in the same region, not attended with râles or with diminution of percussion-resonance. The sputa throughout were profuse, but bronchial. The case was treated at first with bromide of potassium, ipecac, and small doses of iodide and citrate of potassium, and with cups and mustard locally. Later, strychnia, aromatic sulphuric acid, and oil of eucalyptus were given freely. Convalescence was interrupted by a relapse. The patient was not able to leave the house for five or six weeks.

*Case III.*—On February 8, Mrs. —, who had been frequently visiting the patient whose case has just been described, was seized with a feeling of weakness and depression, followed by headache, and soon after by an irritating, painful cough, which persisted for days, and was accompanied by a bronchitis, and at one time by slight congestion of the base of one lung.

The sweating in this case was marked, though not so excessive. The softness of the pulse was also very noticeable.

*Case IV.*—Miss —, sister of Case II., was attacked on February 10 with severe headache, accompanied with vertigo. This was followed soon after by fever, at first moderate in degree, afterwards higher, but attended, as in the previous cases, with a soft, compressible pulse, and with profuse sweating. The physical signs consisted of faint breath-

ing and pectoriloquy in the earlier stages. Later there seemed to be almost absolute consolidation of one lung; and still later, while this condition was disappearing, the other lung became similarly affected: the period of consolidation in each case was followed by some days during which there were marked coarse crepitant or subcrepitant râles. There was incessant cough, with nausea and persistent vomiting, the latter being so unyielding as to necessitate the use of rectal injections of milk, egg, and brandy, for forty-eight hours, as the sole means of nourishing the patient. At no time was there a pneumonic sputum. The expectoration was scanty, always frothy, and unmistakably bronchial in character.

*Case V.*—Miss —, another sister, the one who had returned from Europe, was compelled to go to bed on February 15 having an intense headache and some fever. This, however, can hardly be considered in her case to be the onset of the disease, as during the voyage home, and indeed ever since her arrival, she had suffered from the headache, persistent cough, and general prostration which seem to be almost invariable symptoms of this affection. Her case ran a course very similar to the preceding one. The fever for a day or two was high, the temperature reaching  $104^{\circ}$  and  $104.5^{\circ}$ , but even at this time the pulse was never above 100. Later there was rapid defervescence, but the respirations remained frequent, varying from 30 to 35 per minute; the pulse at the same time running only from 80 to 85. There were profuse sweating, with pectoriloquy, and bronchial respiration over the left lung, decidedly harsh respiration over the right lung, persistent cough, nausea, and vomiting, absence of pneumonic sputa, etc.

*Case VI.*—Dr. —, the nephew who had

been in Europe, was at this time affected in a similar manner, but in a less degree. In his case the physical signs never progressed beyond a general absence of respiratory murmur at the base of the chest; there were moderate night-sweats, an annoying cough, paroxysmal in character and with but little expectoration, and general weakness.

*Case VII.*—Mr. —, a young man who had been very assiduous in attendance upon Case II., developed the premonitory symptoms on February 9. His attack began with a severe headache, followed by slight tremors, but no regular chill. A loose, bronchial cough came on, was severe for a few days, and then subsided almost entirely. No physical signs, except very slight bronchitis, were discoverable. On February 14 the pulse and temperature were normal. On February 15, in the evening, the patient was found with a temperature of 103°, respiration 33, pulse 100, and great prostration. There were bronchial respiration, pectoriloquy, and slightly diminished percussion-resonance over the left lung up to the spine of the scapula. This condition, which in the light of subsequent studies we now believe to have been only an intense congestion, went on, in spite of treatment, until a true pneumonia was developed, which ran the usual course, being attended, however, by a marked disproportion between the pulse and respiration ratio, by profuse night-sweats, and by the physical symptoms indicating enlarged bronchial glands, and which will be described later. Pneumonic sputa were present. During convalescence the right lung seemed to be threatened, and the breathing over a circumscribed portion became harsh, almost bronchial; but this condition suddenly disappeared just when it was thought to be about to become pneu-

monic. Convalescence was slow, and the patient recovered strength with difficulty.

*Case VIII.*—Mrs. —, who had been helping take care of many of the invalids, was attacked on February 23. The case ran the usual course,—headache, bronchitis, paroxysmal cough, vomiting, night-sweats, hurried respiration, etc.

*Case IX.*—Nurse —, who had been in charge of Case IV., was affected in a similar manner. In her case there were marked evidences of the bronchial adenopathy; the percussion-resonance at the bifurcation of the trachea was decidedly impaired. There were great hoarseness and profuse night-sweats. The other symptoms were also present, but in a less degree.

*Case X.*—Dr. W., who was in attendance on Cases III. and IV., was attacked on February 27 with the usual initial symptoms, developed slight fever, marked and annoying cough, and great prostration. After the subsidence of the fever, the cough still persisting, an examination of the chest disclosed the physical signs indicative of bronchial glandular enlargements. In other respects his case closely resembled those already described.

*Case XI.*—Mr. —, brother of Cases II., IV., and V., was attacked on February 29 with chill, fever, and headache. Within a few hours cough supervened, and was accompanied with great weakness; but no physical symptoms were found until March 3, when bronchial breathing, slight dulness, and marked pectoriloquy were heard over the middle of the left lung. These disappeared as rapidly as they had come, and on March 6 the lung-sounds were almost normal on both sides, except that the percussion-resonance was of higher pitch and slightly tympanitic over both sides; there were moderately in-

creased pectoriloquy and dulness over the root of the left lung. Night-sweats, paroxysmal cough, and nausea and vomiting came on during the progress of the case, and still later there was engorgement of the lymphatic glands of the neck, as evidenced by swelling, tenderness, and dysphagia.

*Case XII.*—Mrs. —, wife of Case I., was affected similarly. The cough in her case was the predominant symptom, being excessively painful and very frequent. Owing to the absence of adipose tissue the physical signs here were well marked, percussion showing plainly the area of dulness in the region of the bronchial and tracheal glands. Auscultation revealed very little change except a decided diminution in the amount of air entering the lungs.

*Case XIII.*—Annie —, servant in the family in which the original cases occurred, developed some of the symptoms in a mild form on March 5. She had slight fever, moderate night-sweats, troublesome cough, etc. In this instance, together with the signs of enlarged bronchial glands there were vesiculo-tympanic resonance over the entire chest, and slight bronchophony over the root of the left lung.

*Case XIV.*—Mr. —, who resides in New York, visited Philadelphia and called on Case II. on February 15. On March 7, three weeks later, he had a chill, followed by headache and sneezing. At this time the tracheal dulness was marked, and there was decided diminution of the respiratory murmur. With these symptoms there was more than ordinary febrile disturbance, the pulse reaching 120 and the temperature  $104^{\circ}$  or  $105^{\circ}$ . Twenty-four hours later (March 8), and without the administration of any arterial sedative, complete defervescence had occurred, the pulse being only 66, and the temperature  $98.4^{\circ}$ , the phys-

ical signs continuing. Convalescence here was very rapid, no bronchitis or other pulmonary complication occurring. In this case there was unequal dilatation of the pupils which was unmistakable, and which we attributed to pressure on the sympathetic nerve by the enlarged glands.

*Case XV.*—Sister of Case XIV., æt. 12, and a playmate of a younger sister of Cases II., IV., and V., with whom she had spent some time two weeks previously, developed the physical signs imperfectly, with cough and ineffectual attempts at vomiting. Convalescence rapid.

*Case XVI.*—Mr. B., who had been visited professionally by Dr. W. (Case VI.) while the latter was suffering with the disease, developed symptoms on February 27, and went through the ordinary course, complicated, however, by an intercurrent attack of rheumatic gout. In his case there were apparently the signs of tracheal and bronchial enlargement, with marked absence of respiratory murmur over the base of the right lung. Convalescence was slow.

*Case XVII.*—Mr. — returned from London, on February 6, with a hacking, frequent, paroxysmal cough. The usual physical signs were present, with inequality in the amount of air going into the two lungs. There were also night-sweats and the alteration in the pulse and respiration ratio noticed in the other cases.

*Case XVIII.*—Mrs. —, housekeeper to Dr. W., Case VI., and who had not been at the infected house, developed many of the symptoms of the disease; the physical signs being present, and the cough being frequent and painful.

*Case XIX.*—Dr. W., Sr., who was in attendance on several of the foregoing cases, was affected on March 25 with a severe pain,



situated at the root of the neck, extending into the left shoulder and both arms, and radiating towards the præcordium. It was occasionally much aggravated by the act of swallowing. At this time he had slight fever and a frequent though soft pulse, once running up as high as 144, with general prostration and mental depression. A day or two later, he having been obliged to go to bed, night-sweats came on, as in the other cases, the original symptoms slowly subsiding. At this time the physical signs were thought to indicate slight glandular enlargement; but, the neck being very muscular, percussion of the tracheal region was unusually obscure.

We may now state that up to the point reached in our general description the observer will be surprised to find nothing in the physical signs that will account for the pulmonary symptoms; in some of the cases **not even the evidences of bronchitis**: in almost all of them, however, he will notice feebleness of the respiratory murmur on both sides of the chest, or perhaps more marked on one. This becomes more evident towards the beginning of the second week, when the fever may have subsided entirely. Now, if at this stage, and even earlier (we have noticed the fact as early as the second day of the disease), our attention is given to the superior inter-scapular region, evidences will be found of enlargement of the bronchial glands. As to this fact, we should state that the first cases were not studied from this point of view, and we cannot tell whether they presented the same physical signs.

M. Guéneau de Mussy\* devotes two chapters to the condition which he calls *adénopathie bronchique*. We believe him to have been the first to call attention to the information that may be gained by percussion of the spinous processes of the vertebræ over the course of the trachea. Following this line in the healthy subject, a distinct tubular (high pitched and slightly tympanitic) sound is elicited by percussion, down to the point of bifurcation of the trachea, on the level of the fourth dorsal vertebra. Opposite the fifth, and downwards, we get the lower-pitched pulmonary resonance. When the tracheal and bronchial glands are enlarged, the tubular sound over the upper dorsal vertebræ is replaced by dullness, which may contrast sharply, above with the tracheal, and below with the vesicular resonance. In Cases VII., IX., X., XI., XII., XIII., XIV., XVI., and XVIII., we have been able to demonstrate distinctly by this method the enlargement of the lymphatic glands.

The symptomatology of these cases becomes clear when regarded from this point of view, for, indeed, all the symptoms of *adénopathie bronchique*, as termed by De Mussy, or *tuberculisation des ganglions bronchiques*, as styled by Barthez and Rilliet,† were present in our cases. Of course these authors, and others by them quoted, speak of a chronic affection, and

\* Clinique Médicale, tom. 1er. Paris, 1874.

† Maladies des Enfants. T. 3me, pp. 600. A very valuable monograph.

add to the local symptoms those of the cachexy. But we should here observe that De Mussy\* does not overlook the presence of this factor in some acute affections. In whooping-cough it has been indeed the basis of one of the hypotheses of the pathology of the disease.†

Keeping this subject in view, let us look at a most curious and frequent complication of influenza,—the so-called pneumonia. The differences between ordinary pneumonia and the consolidations of the lung that present themselves in the course of influenza are thus set forth by M. Piorry;‡ “Ordinary pneumonia commences abruptly; in influenza the pneumonia follows upon a bronchitis, and develops gradually. In the early stages of ordinary pneumonia we find at once dulness upon percussion, afterwards the crepitant râle, and finally bronchial breathing. In the pneumonia of influenza we have at first weakness, then absence of the vesicular murmur. The respiration soon becomes tubular, without being preceded by dulness or crepitant râle. The sputa are not rusty in influenza, and the consolidation generally occupies

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\* Loc. cit. T. rer, p. 593. He says, “Dans un grand nombre d'affections chroniques et dans beaucoup de congestions aiguës des organes thoraciques, on constate des modifications du bruit respiratoire souvent limitées à un seul côté ou même à un seul lobe, sans lésion locale appréciable. Rien n'est plus commun dans la phymatose, dans la rougeole, dans la coqueluche.”

† Friedleben. Quoted in article on Whooping-Cough in Ziemssen's Cyclopædia of Medicine.

‡ Lettre sur les caractères distinctifs des pneumonies observées pendant l'épidémie de grippe. Gaz. Méd., Avril 8, 1837.

the posterior aspect of the lungs." It will be seen that these differences apply as well to our cases as to those thus described by the master hand of Piorry in 1837. We should add that the extension of these consolidations from one part to another of the lung is very irregular, and that the process is more apt to involve both sides than one. L. Landeau\* says, of one hundred and twenty-five cases of influenza, thirty-three had pneumonia. Of forty cases complicated with pneumonia, in twenty-one it was double, in eleven it affected the right side, and in eight the left.

But the examination of the post-mortem records, and the symptomatology, will carry us one step further, viz., to the conclusion that in the majority of the cases there is no pneumonia at all. The splenified lung, the absence of fever (it has almost always disappeared at the time when the consolidations begin to develop); the age of the patients, the absence of a tendency to be followed by destructive changes, and, above all, the frequent rapid disappearance of the consolidation, all are evidences that will readily exclude catarrhal pneumonia from our consideration.

Now, further to eliminate sources of error, we must state our belief that in a considerable number of the cases in which the physical signs seem to point to a consolidation of the lung there is really no such condensation. In two of our cases

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\* *Mémoire sur la Grippe*, in *Arch. Gén. de Méd.* for 1837.

we found towards the root of the lung, on one side, an area of very slight dulness, over which, and for some distance beyond, there were distinct pectoriloquy and marked bronchial breathing. We may here observe, in passing, that in all our cases the vocal resonance and the bronchial breathing were more marked than in health, on both sides, over the region of bifurcation of the trachea. Returning to our two cases in which there was a marked difference between the two sides, it will be seen that a hasty examination will readily suggest the diagnosis of consolidation. It must be remembered that, as Barthez and Rilliet observe, the chains of lymphatic glands accompany the bronchial tubes to their fourth ramifications, and undoubtedly even the lesser degrees of enlargement of glands so situated in relation to the tubes must act as ready means for the transmission of sound. Such is the fact in the *adénopathie* as described by De Mussy. He has noticed this intensification of the sounds even when by percussion the enlargement of the glands could not be detected, and he further states that the area over which they are transmitted may extend beyond that of the region of larger bronchial tubes.

Now, as to the cases in which there is really a consolidation of the alveolar tissue, we must admit, with some observers, that there may be true croupous pneumonia. Such cases have been reported, but they are extremely rare.

We believe that in all our cases but one the consolidations of the lung should be classified under the head of apneumatosiis, as termed by Fuchs. And the form of collapse present in our cases could be appropriately called congestive collapse.

In connection with the subject we are about to discuss, viz., pressure upon the root of the lung, we have made frequent use of the authorities mentioned in the note below.\*

Irvine and Gull maintain, the former, that the pulmonary disturbances are due to obstruction of the tubes, the latter, that they are owing to disturbed innervation. It is probable that both are factors in their production, and that even other elements, such as disturbed lymphatic absorption and obstruction of the venous return, may have some influence upon the final result. But as in our cases the tumefaction of the glands cannot be said to be great, we must attach the chief importance to the disturbances of innervation,—a theory that is

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\* Sappey. *Anatomic Descriptive*. His description of the relations of the nerves to the other structures at the root of the lung is very good.

Barthez and Rilliet, loc. cit. They give many references.

Guéneau de Mussy, loc. cit.

Ogle. Eight Cases of Aneurism, etc. *Path. Trans.*, vol. xvii. London.

Riegle. Stenosis of the Trachea and Bronchial Tubes. *Ziemssen's Cyclopædia of Med.*, vol. iv.

J. P. Irvine. On the Occurrence of Collapse, Emphysema, and Destructive Pneumonia in Association with Tumors compressing the Bronchi. *Lancet*, March 23, April 6, and April 20, 1878.

Sir William Gull. On Destructive Changes in the Lung from Disease of the Mediastinum invading or compressing the Pneumogastric Nerves or Pulmonary Plexus. *Guy's Hospital Reports*, vol. v., 1859.



further supported by other nervous symptoms that will be mentioned.

The first effect upon the lungs, of mediastinal pressure, seems to be the production of so-called emphysema. We doubt not there may have been emphysema in the cases described by Irvine, for instance; but we believe that in the majority of cases, and certainly in those where, as in ours, the disturbance is an acute one, the lung is to be found in the condition described by Niemeyer as *alveolarektasy*. This distention of the air-vesicles accounts for the somewhat exaggerated resonance (almost vesiculo-tympanitic) that we have noticed in our cases, and also for the marked feebleness of the respiratory murmur.

This is followed by collapse, in some cases due to the secretion in the tubes acting in the valve-like manner first suggested by Gairdner.\* But we submit that in our cases, if the view we have taken of the subject be correct, the collapse obeys rather the laws of vascular disturbance,—that is, it is due to an engorgement of the pulmonary vessels in the affected part. This engorgement may be purely *ex vacuo*, or, as we believe it to be the case when the pulmonary plexus is involved, it may be due almost exclusively to primary vasomotor disturbance. Section of both pneumogastrics will cause such form of collapse, and is generally followed by destruc-

\* On the Pathological State of Lung connected with Bronchitis and Bronchial Obstruction. Edin. Monthly Jour., 1850, 1851.

tive pneumonia. If we could understand clearly what would be the effect of paralysis of the bronchial tubes, we would admit, with Sir Wm. Gull, that that condition might be an important factor in the production of all these pulmonary changes due to pressure upon the plexus. Neither should we forget that Schiff ascribes them all to nutritive or trophic changes. But until our knowledge of pulmonary innervation be more complete we shall rest content with the theory of vaso-motor disturbance in our cases.

One of them is especially valuable as giving support to the view we are endeavoring to bring before our readers. Case XI. presents one day pectoriloquy and bronchial breathing at the root of the left lung; the next day there is dulness of a large portion of the left lower lobe, with bronchophony and bronchial breathing over an area extending from above the angle of the scapula to the base, and out to the axillary line. That is to say, there was, first, engorgement of the left bronchial glands, and the next day the congestive collapse of portions of the lung. On the day after this, no traces could be found of the consolidation. This is certainly not the history of catarrhal pneumonia. However, as there are intimate and reciprocal relations of cause and effect between catarrhal pneumonia and collapse, we can readily see how the condition that we are speaking of may lead to catarrhal or lobular pneumonia (indeed, this is often the case

in collapse, whatever its cause, a more permanent lesion, such as met with in Case VII., and one which may terminate in destructive processes,—so-called tuberculosis as a sequel of influenza.

We should not forget that Graves\* had already suggested that the pulmonary phenomena were due to altered innervation; but he considered this as a manifestation of a general disturbance. To use his words, “the poison which produced influenza acted on the nervous system in general, and on the pulmonary nerves in particular.” It is indeed probable that this fever, like all fevers, is accompanied (cause or effect?) with general nervous disturbance, especially vaso-motor, as indicated by the profuse sweating, but as to this being the chief factor in the production of the local symptoms, we believe that the hypothesis has no other strength beyond its indefiniteness. In this paper we offer an explanation that we believe to be supported by all the clinical facts. We have searched in vain for any statement as to the condition of the bronchial glands in influenza. We find that Nonat† quotes an article from Lobstein, where the author states that he has found “une tuméfaction avec ramollissement rouge des filets nerveux qui accompagnent les rameaux bronchiques.” We confess that we can scarcely conceive how in such careful examination of the lung the condition of the

\* *Annals of Influenza*, p. 347.

† *Loc. cit.*

bronchial glands could have been overlooked.

However, we call attention to the physical signs as they have been pointed out by us, and to the following facts besides. During the prevalence of the pulmonary consolidation, the fever had disappeared in the majority of the cases; and in all of them the pulse had become slow out of all proportion to the respirations, so that some of our patients had what appeared to be a solid lung with a pulse of 60. The respirations were very irregular in some of the cases. One case presented unequal pupils, and all of them more or less vomiting and thoracic pains; all symptoms present in cases of enlarged bronchial glands, and all evidences of disturbance of the great nervous tract about the root of the lung.

We should also add that in Case XI. the recovery was slow; the cervical glands became undoubtedly engorged; there were pain and slight tumefaction of the neck, with considerable difficulty in swallowing, and return of the fever.

We have discarded entirely the views of Nonat as to the presence of fibrinous bronchitis in influenza, because his observations have been distinctly contradicted by subsequent observers. Nor have we considered it necessary to touch upon the subject of venous obstruction.

We should state that the average duration of the disease was three weeks.

From the study, then, of the clinical facts, we are led to believe that our pa-

tients were affected with the specific bronchitis called influenza, and that, in these cases at least, the catarrhal inflammation gave rise to more or less persistent tumefaction of the bronchial glands.\*

Not having one single post-mortem examination in support of these views, we confess to a feeling of hesitation before accepting them. We never should have brought them before our readers were it not that the investigation has given us the opportunity of calling attention to a group of clinical facts that have not been sufficiently dwelt upon by our American writers; and, finally, it has led us to treat of an epidemic disease which is probably now on its way from Europe to our shores.

\* Our views in regard to the glandular element in the production of the pulmonary symptoms were strongly confirmed by the following case, which came under our notice whilst engaged in the examination of these cases:

A patient was admitted to the female venereal wards of the Philadelphia Hospital in the early secondary stage of syphilis. She was covered with a profuse papular eruption, and had the characteristic fever and the usual evidences of glandular engorgement in the inguinal, epitrochlear, and post-cervical regions. At the time of admission there were no pulmonary symptoms except those of a mild bronchitis. Through a misunderstanding, specific treatment was not employed for some days. During this time the cough became spasmodic, was accompanied by stridulous inspiration and marked hoarseness almost amounting to aphonia, and brought on paroxysms of dyspnoea attended with suffocation, cyanosis, and intense mental distress. The pupils were unequal, the left being noticeably larger than the right. There were dysphagia and a sense of oppression at the root of the neck. There were vesiculo-tympanic resonance over both lungs, and well-marked dulness over the upper dorsal vertebræ, extending somewhat into the left vertebral groove. At the root of the left lung there were intense bronchophony and distinct bronchial breathing. There were also evidences of impaired expansion of the left lung. Under the free administration of protiodide of mercury these symptoms gradually disappeared coincidently with the fading of the eruption and the diminution in size of the superficial lymphatics.

A few words in conclusion in regard to treatment. In the early cases the cough and febrile excitement were combated, as in ordinary cases of bronchitis, with sedative expectorants and opium. A fuller experience and more careful study of the disease, together with the recognition of what we believe to be its essential features,—the bronchial adenopathy and the vaso-motor depression,—have led us to abandon this form of treatment, at least in the majority of uncomplicated cases. Instead we have employed such drugs as stimulate the respiratory centres and give tone to the vascular system, viz., quinine, strychnia, sulphate of zinc, and ergot. As the result of our experience with these agents, we have come to the conclusion that, without being positively curative, they tend to shorten the intensity and duration of the disease. Certainly, in some cases we were satisfied that the use of opium and bromide of potassium had been productive of evil rather than beneficial results, and were forced to abandon them.

In addition to the internal remedies mentioned we have employed counter-irritation by means of iodine on the summit of the chest anteriorly and posteriorly, with the view of hastening the absorption of the engorged glands. To this end we have also considered the administration of arsenic, as indicated in the later stages of the disease. Special symptoms were treated as in cases where they complicate other diseases: persistent vomiting by abstinence



from stomach-diet, and by the use of rectal injections; night-sweats, when continuing after the subsidence of the other symptoms, by aromatic sulphuric acid; the bronchitis, when, as in some cases, it was obstinate and seemed to depend upon relaxation, by oil of eucalyptus and muriate of ammonia.

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